CLAIMS

1. A hot-rolled-strip production method wherein a hot rolled strip obtained by rolling with a hot rolling mill is conveyed by a hot runout table, and is coiled with a coiler, the production method comprising the steps of:

squirting a fluid jet above the hot rolled strip conveyed by the hot runout table so as to pass over the hot rolled strip without touching a surface of the hot rolled strip running on a pass line (strip-conveying surface of the hot runout table); and

causing a portion of the strip displaced upward from the pass line beyond a predetermined level to collide with the fluid jet in order to correct the displacement of the portion.

2. The hot-rolled-strip production method according to claim 1, wherein the height of a center line of the fluid jet passing over the hot rolled strip, from the pass line is within the range of 50 mm to 450 mm.

3. The hot-rolled-strip production method according to claim 1, wherein the height of a center line of the fluid jet passing over the hot rolled strip, from the pass line is more than or equal to 50 mm and less than 200 mm.

4. The hot-rolled-strip production method according to any of claims 1 to 3, wherein the line-direction thrust F_L of the fluid jet passing above the hot rolled strip is defined by the following equation (1), and is set to be within the range of 10 kgf to 50 kgf:

$$F_L = [\rho A(v\cos(\pi\times\alpha/180)-u)^2]/9.8 \qquad \dots (1)$$

wherein ρ: the density of fluid that forms the fluid jet (kg/m^3)

A: the cross-sectional area of an aperture of a fluid-squirting nozzle (m^2)

v: the velocity of the fluid jet (m/sec)

u: the running velocity of the hot rolled strip (m/sec)

α: the angle of the squirting direction of the fluid jet with respect to a strip running direction (°)

5. The hot-rolled-strip production method according to any of claims 1 to 4, wherein the fluid jet is squirted at an angle α to a strip running direction, and the angle α satisfies the condition $0° \leq \alpha < 90°$.

6. The hot-rolled-strip production method according to claim 5, wherein a velocity component in the longitudinal direction of the pass line of the fluid jet passing above the hot rolled strip is higher than a running velocity of

the hot rolled strip.

7. The hot-rolled-strip production method according to claim 5, wherein a velocity component in the longitudinal direction of the pass line of the fluid jet passing above a head end of the hot rolled strip is higher than a running velocity of the hot rolled strip, and a velocity component in the longitudinal direction of the pass line of the fluid jet passing above a tail end of the hot rolled strip is lower than the running velocity of the hot rolled strip.

8. The hot-rolled-strip production method according to any of claims 1 to 4, wherein the fluid jet is squirted at an angle α to a counter strip running direction, and the angle α satisfies the condition $0° \leq \alpha < 90°$.

9. The hot-rolled-strip production method according to any of claims 1 to 4, wherein the fluid jet is squirted at a head end of the hot rolled strip at an angle α to a strip running direction, and the angle α satisfies the condition $0° \leq \alpha < 90°$, and wherein the fluid jet is squirted at a tail end of the hot rolled strip at an angle α to a counter running direction, and the angle α satisfies the condition $0° \leq \alpha < 90°$.

10. the hot-rolled-strip production method according to any of claims 1 to 9, wherein squirting of the fluid jet is performed at a plurality of positions appropriately spaced in the longitudinal direction of the hot runout table.

11. The hot-rolled-strip production method according to claim 10, wherein the interval between the fluid-jet squirting positions in the longitudinal direction of the hot runout table is within the range of 5 m to 15 m.

12. The hot-rolled-strip production method according to any of claims 1 to 11, wherein the fluid jet is allowed to completely pass over the hot rolled strip in the widthwise direction by setting an angle α of the squirting direction of the fluid jet with respect to a strip running direction or a counter running direction so as to satisfy the condition $0° \leq \alpha < 90°$.

13. The hot-rolled-strip production method according to claim 12, wherein squirting of the fluid jet is performed at a plurality of positions appropriately spaced in the longitudinal direction of the hot runout table, and wherein imaginary jet pass lines x are obtained by projecting, onto the surface of the hot rolled strip, the paths of fluid jets that completely pass over the hot rolled strip in the

widthwise direction, and ends of jet pass lines x and x adjacent in the longitudinal direction of the pass line, of the imaginary jet pass lines x, correspond or overlap with each other in the longitudinal direction of the pass line.

14. The hot-rolled-strip production method according to any of claims 1 to 13, wherein squirting of the fluid jet is performed on both widthwise sides of the hot runout table, and fluid jets that are squirted at positions opposing across the hot runout table (including positions that are asymmetrically provided with respect to the hot runout table) and that pass over the hot rolled strip are substantially equal in a widthwise thrust F_W defined by the following equation (2):

$$F_W = [\rho A(v\sin(\pi\times\alpha/180))^2]/9.8 \quad \dots (2)$$

wherein ρ: the density of fluid that forms the fluid jet (kg/m^3)

A: the cross-sectional area of an aperture of a fluid-squirting nozzle (m^2)

v: the velocity of the fluid jet (m/sec)

α: the angle of the squirting direction of the fluid jets with respect to the longitudinal direction of the pass line (a strip running direction or a counter running direction) (°)

15. The hot-rolled-strip production method according to any of claims 1 to 11, wherein the fluid jet passes above the hot rolled strip in the longitudinal direction of the pass line, and is collected above the hot rolled strip on the downstream side in the squirting direction of the fluid jet.

16. The hot-rolled-strip production method according to any of claims 1 to 15, wherein the squirting direction of the fluid jet is inclined upward or downward with respect to a horizontal plane, and the inclination angle β of the squirting direction of the fluid jet with respect to the horizontal plane is 10° or less.

17. The hot-rolled-strip production method according to any of claims 1 to 16, wherein the hot rolled strip conveyed by the hot runout table is cooled by cooling water supplied from above, and a shield for shielding the fluid jet from the cooling water is provided above the fluid jet.

18. The hot-rolled-strip production method according to claim 17, wherein the shield is a shielding member provided above the fluid jet.

19. The hot-rolled-strip production method according

to claim 17, wherein the shield is a shielding fluid jet that flows substantially parallel to and above the fluid jet.

20. A hot-rolled-strip production system comprising:

a hot rolling train;

a hot runout table provided on an exit side of the hot rolling train to convey a hot rolled strip; and

a coiler for coiling the hot rolled strip conveyed by the hot runout table,

wherein a fluid-squirting nozzle is provided by the side of or above the hot runout table to squirt a fluid jet above the hot rolled strip conveyed by the hot runout table so that the fluid jet passes over the hot rolled strip without touching a surface of the hot rolled strip running on a pass line (a strip-conveying surface of the hot runout table), and the height of the center of a nozzle aperture of the fluid-squirting nozzle from the pass line is within the range of 50 mm to 450 mm.

21. The hot-rolled-strip production system according to claim 20, wherein the height of the center of the nozzle aperture of the fluid-squirting nozzle from the pass line is more than or equal to 50 mm and less than 200 mm.

22. The hot-rolled-strip production system according

to claim 20 or 21, wherein the angle α of a squirting direction of the fluid jet from the fluid-squirting nozzle with respect to a strip running direction satisfies the condition $0° \leq \alpha < 90°$.

23. The hot-rolled-strip production system according to claim 20 or 21, wherein the angle α of a squirting direction of the fluid jet from the fluid-squirting nozzle with respect to a counter running direction satisfies the condition $0° \leq \alpha < 90°$.

24. The hot-rolled-strip production system according to claim 20 or 21, wherein the fluid-squirting nozzle includes a fluid-squirting nozzle that allows the angle α of a squirting direction of the fluid jet with respect to a strip running direction to satisfy the condition $0° \leq \alpha < 90°$, and a fluid-squirting nozzle that allows the angle α of a squirting direction of the fluid jet with respect to a counter running direction to satisfy the condition $0° \leq \alpha < 90°$.

25. The hot-rolled-strip production system according to any of claims 20 to 24, wherein the fluid-squirting nozzle includes a plurality of fluid-squirting nozzles appropriately spaced in the longitudinal direction of the

hot runout table.

26. The hot-rolled-strip production system according to claim 25, wherein the interval between the fluid-squirting nozzles in the longitudinal direction of the hot runout table is within the range of 5 m to 15 m.

27. The hot-rolled-strip production system according to any of claims 20 to 25, wherein the angle α of a squirting direction of the fluid jet from the fluid-squirting nozzle with respect to a strip running direction or a counter running direction satisfies the condition $0° \leq \alpha < 90°$, and the fluid jet squirted from the fluid-squirting nozzle completely passes over the hot rolled strip in the widthwise direction.

28. The hot-rolled-strip production system according to claim 27, wherein the fluid-squirting nozzle includes a plurality of fluid-squirting nozzles appropriately spaced in the longitudinal direction of the hot runout table, imaginary jet pass lines x are obtained by projecting, onto the surface of the hot rolled strip, the paths of fluid jets that completely pass over the hot rolled strip in the widthwise direction, and the interval and the squirting direction of the fluid-squirting nozzles are determined so

that ends of jet pass lines x and x adjacent in the longitudinal direction of the pass line, of the imaginary jet pass lines x, correspond or overlap with each other in the pass-line longitudinal direction.

29. The hot-rolled-strip production system according to any of claims 20 to 26, wherein the fluid-squirting nozzle is provided above the pass line so that the squirted fluid jet passes above the hot rolled strip in the longitudinal direction of the pass line, and collecting means for collecting the fluid jet is provided above the pass line on the downstream side in the squirting direction of the fluid jet.

30. The hot-rolled-strip production system according to any of claims 20 to 29, wherein a squirting direction of the fluid jet from the fluid-squirting nozzle is inclined upward or downward with respect to a horizontal plane, and the inclination angle β of the squirting direction with respect to the horizontal plane is 10° or less.

31. The hot-rolled-strip production system according to any of claims 20 to 30, further comprising:

a cooling device for supplying cooling water from above to the hot rolled strip conveyed by the hot runout table;

and

a shielding member provided above the hot runout table to shield the fluid jet squirted from the fluid-squirting nozzle from the cooling water.

32. The hot-rolled-strip production system according to any of claims 20 to 30, further comprising:

a cooling device for supplying cooling water from above to the hot rolled strip conveyed by the hot runout table; and

a shielding-fluid-jet squirting nozzle that squirts, above and substantially parallel to the fluid jet squirted from the fluid-squirting nozzle, a shielding fluid jet for shielding the fluid jet from the cooling water.